

SECONDARY ANALYSIS OF THE 2008 OREGON HEALTHY TEENS SURVEY:
PREDICTORS OF GAMBLING BEHAVIOR AMONG 8TH AND
11TH GRADE BOYS AND GIRLS

*Report to the Oregon Department of Human Services
Addictions and Mental Health Division*

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EXECUTIVE SUMMARY

The purpose of this study was to utilize the 2008 OHT data to examine the associations of gambling with other health-related behaviors and attitudes among youth in Oregon. It is not currently clear whether the correlates of gambling involvement are similar for male and female adolescents or for boys and girls at different ages. Most probably, gender differences in gambling reflect complex attitudes about recreational activities, and differences in opportunities, that vary as boys and girls become older. A series of Chi-Square analyses were conducted to assess the relationships between active gambling and the other risk and protective behaviors assessed in the 2008 OHT survey. Logistic regression analysis was subsequently used to assess the combined and independent associations of the variables with active gambling among 8th and 11th grade girls and boys.

Findings

- Among 8th grade boys and girls, *poorer* self-reported mental health status and unmet mental health care needs were each associated with higher rates of active gambling. Oppositely, in 11th grade boys, *better* self-reported mental health status was associated with higher rates of active gambling.
- In 8th grade and 11th grade girls only, self-perceptions of being either over- or under-weight were associated with higher rates of active gambling relative to girls who felt their weight was about right.
- In both 8th grade and 11th grade boys, *higher* rates of gambling were observed among youth who reported higher levels of physical activity, and among boys who eat five servings of fruits or vegetables daily, than in boys who reported lower levels of physical activity and eating fewer fruits and vegetables.
- Significant relationships were consistently observed between active gambling and all of the assessed substance use and personal safety behaviors in all four of the (gender x grade) cohorts. Active gamblers were more likely to have used alcohol, tobacco, and illegal substances, sold illegal drugs, been in a car driven by a drunk driver, carried a weapon, been in a physical fight, stolen something worth more than \$10, suspended from school, and stopped by the police than non-gamblers.
- Active gamblers, in all four cohorts, reported significantly less strong personal, parental and community health beliefs, and lower levels of perceived social control in their neighborhoods than non-gamblers.
- Logistic regression models for the four grade x gender cohorts were able to explain relatively small amounts of the variance in active gambling. There was significant consistency in individual variables contributing to the four models as current alcohol use, personal safety behaviors, and involvement in illegal behavior were significant predictors of active gambling in all four cohorts. High levels of physical activity, peer risk behavior, and personal health beliefs were independently associated with active gambling in three of the four cohorts.

INTRODUCTION

Oregon's voters first approved a state-run lottery in 1984 and since that time opportunities for legal gambling have expanded (Oregon, DHS-AMH, 2009, p.1-4). Revenue derived from gambling makes a significant contribution to the state's budget, with more than \$1 billion in biennial revenues derived from the state lottery. For the majority of adults, gambling is experienced as a form of entertainment. Aside from possible, albeit debated, economic benefits to individuals and communities, gambling provides participants with opportunities for socialization, recreational diversion, and activities that exercise memory, concentration, and problem-solving skills (Magoon, Gupta, & Derevensky, 2005). When betting is infrequent and of limited value, gambling does not threaten individuals' or families' well-being.

Problem gambling is not uncommon, however. The National Council on Problem Gambling uses the term *problem gambling* to describe all patterns of gambling behavior that compromise, disrupt or damage personal, family or vocational pursuits (Cox, Lesieur, Rosenthal, et al, 1997). Assessments conducted during the past 10 years estimate that 2.7% of Oregon's adults meet criteria for classification as problem gamblers (Moore, 2001, 2006).

There is consistent evidence from studies conducted with adult populations linking gambling with a broad range of unintended negative consequences. These difficulties include alcohol and other drug abuse (Abbott et al., 2004; Cunningham-Williams, et al., 1998; Lesieur & Heineman, 1988; National Research Council, 1999); family dysfunction and domestic abuse (Jacobs et al., 1989; Lorenz & Yaffee, 1988; Wildman, 1989); psychiatric conditions (Blaszczynski & Steel, 1998; McCormick et al., 1984); suicidal ideation and suicide (Cunningham-Williams, et al., 1998; McCleary, et al., 1998; Phillips, Welty, & Smith, 1997); and criminal behavior (Gerstein et al., 1999; National Research Council, 1999). What is not clear is how much gambling contributes to these social problems, if problem gambling is an outcome of these other behaviors, or if other, higher-order factors such as personality traits or social conditions are the origin of all these outcomes.

Oregon's legal statutes stipulate that youth may participate in charitable gaming (i.e., games of luck in which the proceeds are used to fund activities of charitable organizations), but other forms of gambling are illegal for all persons younger than 18-years of age. Despite this prohibition, survey data illustrate that gambling is a common activity among youth. Studies conducted nationally over the past 15 years suggest that youth gambling has increased with the expansion of gambling opportunities (Stinchfield & Winters, 1998). Data from the 2008 Oregon Healthy Teens survey, conducted with 8th and 11th grade students, estimates that between 17% (8th grade girls) and 40% (11th grade boys) have bet at least \$1 during the past 3 months (<http://www.dhs.state.or.us/dhs/ph/chs/youthsurvey/ohtdata.shtml>). Given the broad range of possible gambling activities, the small amounts often gambled, and the informal setting of much gambling, enforcement of gambling laws is challenging. Additionally, parents and schools often do not see gambling by youth as a problem (Gupta & Derevensky, 2000; Jacobs, 2000; Shaffer & Hall, 1996; Stinchfield & Winters, 1998). Although parents are generally unconcerned by adolescent gambling (Felsger, Derevensky, & Gupta, 2003, pp.362-

363), a recent study conducted in Oregon concluded that 4.6% of youth sampled were 'at risk' gamblers and 1.3% were problem gamblers (Volberg, Hedberg & Moore, 2008).

Studies conducted with adolescents suggest that, as with adults, gambling may be a single component in a broader range of problem behaviors which include tobacco, alcohol and drug use, illegal activities, violent behavior including fighting and firearm use, truancy, poor academic performance, and poor mental health (Abbott et al., 2004; Gupta & Derevensky, 1998; Jacobs, 2000; National Research Council, 1999; Stinchfield et al., 1997; Vitaro, Brendgen, Ladoucer, & Tremblay, 2001; Volberg, Hedberg, & Moore, 2008; Wanner et al., 2006). Several psychological characteristics are associated with gambling frequency among adolescents (Gupta & Derevensky, 1998; Vitaro et al., 2001). These characteristics include elevated levels of impulsivity, depression, dissociation, excitability, and disinhibition, and low levels of harm avoidance. Gupta and Derevensky concluded that excitability and dissociation were the best predictors of problem gambling among boys, while depression, dissociation and drug use were the best predictors among girls. Poor parenting, in the form of low parental monitoring, has also been shown to contribute to the development of antisocial behavioral patterns, including gambling, during adolescence (Dishion, French, & Patterson, 1995; Vachon et al., 2004).

Gambling among adolescents has increased over the past two decades (Langhinrichsen-Rohling, Rohde, Seeley, & Rohling, 2004; Messerlian, Derevensky, & Gupta, 2005). Youth who initiate gambling, alcohol and marijuana use at an early age are at heightened risk for later problems with these behaviors (Custer & Milt, 1985; Ellickson, Hays, & Bell, 1992; Fisher, 1993; Jacobs, 2000; Shaffer & Hall, 2001; Volberg, 1994; Winters et al., 1993, 2002; Wynne, Smith, & Jacobs, 1996). Adolescents' heightened vulnerability to addiction is theorized to relate to the neurodevelopmental characteristics of this age group (Chambers, Taylor, & Potenza, 2003). Because early exposure to these behaviors is related to subsequent problems, some refer to these behaviors as being 'potentially addictive' (Wanner et al., 2006). Understanding which youth gamble, and thereby put themselves at risk of later problems, is therefore of value for gambling prevention efforts. By focusing on factors associated with the initiation of gambling among youth, this study will inform programmatic efforts that seek to prevent gambling among Oregon's youth.

The purpose of this study is to utilize the 2008 OHT data to examine the correlates of gambling behavior among youth in Oregon. Consistent age and gender differences in gambling have been observed in previous studies (Volberg, 2002). Because older youth gamble more frequently than those younger, and boys more frequently than girls, it is likely that age and gender differences in observed relationships exist. It is not currently clear whether the correlates of gambling involvement are similar for male and female adolescents or for boys and girls at different ages. Most probably, gender differences in gambling reflect complex attitudes about recreational activities, and differences in opportunities, that vary as boys and girls become older (Bettencourt & Miller, 1996; Kiesler & Sproull, 1985).

METHODOLOGY

2008 Oregon Healthy Teens Survey

'Oregon Healthy Teens' (OHT) is a comprehensive, school-based, anonymous and voluntary survey. The survey is used to monitor risk behaviors and other factors that influence the health and well-being of Oregon's children and adolescents. Data from the surveys are used to develop comprehensive plans and programs which address the needs of youth. The focus areas measured by OHT include:

- Tobacco, alcohol and other drug use and access to substances;
- Protective factors and assets such as parental supervision, neighborhood characteristics, and factors related to positive youth development;
- Physical activity, nutrition and body weight;
- Sexual risk behaviors;
- Mental health concerns including suicidal ideation, depression, harassment, and body image;
- Intentional and unintentional injury including violence and vehicle safety; and,
- Health care access, use of school-based health centers, and screening for conditions such as asthma.

Surveys are administered annually to more than one-third of Oregon's 8th and 11th graders enrolled in public schools. For the 2007 and 2008 OHT administrations, school districts were stratified according to eight Oregon Department of Education (ODE) Educational Service District (ESD) regions. Within each of the ESDs, districts were sorted according to high school enrollment (grades 9-12), and school districts were randomly selected as part of the state sample for either 2007 or for 2008. For small school districts, all high schools and feeder middle schools were selected for inclusion in the selected year. Among larger districts, half of high schools, along with their feeder middle schools, were randomly selected to be included in each year.

In 2008, OHT collected information from more than 28,000 Oregon adolescents. Participating students came from 297 schools in 33 of Oregon's 36 counties. Participation in the OHT survey is voluntary but participation in the survey is high. In 2008, 85.8% of children sampled completed the survey. The final samples included 15,865 8th grade (8,260 female, 7,605 male) and 11,061 11th grade students (5,787 female, 5,274 male). Two versions of the survey are created annually: one for students in 8th grade, and a second version designed for 11th grade students. In 2008 the 8th grade survey contained 188 items and the 11th grade survey was comprised of 204 items. Administration of the survey takes approximately 40 minutes including distribution of the survey materials and reading of instructions to the students. Rates of missing data are less than 2% for items asked early in the survey but substantial, sometimes more than 10%, for questions asked towards the end of the survey. Data presented in this report are un-weighted data, not data weighted to adjust for unequal probability of inclusion in the sample and participation in the survey. Un-weighted data was utilized because the purpose of the study was to determine relationships between gambling

and potential risk and protective factors, rather than to estimate the prevalence of specific behaviors in a broader population.

Sample Demographics

The mean ages of participants were 13.7 years (SD = 0.5) in 8th grade, and 16.7 years (SD = 0.5) in 11th grade. As illustrated in Table 1, participants were generally White (84.5% 8th grade; 88.4% 11th grade) and non-Hispanic (81.6% 8th grade; 85.2% 11th grade). English was the language spoken most often in participants' homes (89% English, 8% Spanish, 3% other language). Although the OHT survey does not assess the socioeconomic status of participants, given the sampling strategies and the high rate of participation by both schools (i.e., greater than 70%) and students-within-schools, the sample appears representative of the broader population.

Gambling Behavior

The primary focus of this report is on the correlates of gambling behavior among youth in Oregon. The 8th grade version of the 2008 OHT survey asked three questions about gambling. Two items assessed possible at-risk gambling:

During the last 12 months, have you ever felt bad about the amount you bet, or about what happens when you bet money?

- A. I don't bet for money
- B. Yes
- C. No

During the last 12 months, have you ever felt that you would like to stop betting money but don't think you could?

- A. I don't bet for money
- B. Yes
- C. No

A third item assessed active gambling:

In total, how much money have you bet in any form (lottery, card games, bingo, Internet, sports, with friends) in the past three months?

- A. \$0
- B. \$1 to \$10
- C. \$11 to \$50
- D. \$51 to \$100
- E. \$101 to \$200
- F. \$201 to \$500
- G. Over \$500

Table 1

Characteristics of the Participating Students by Gender and Grade – 2008 Oregon Healthy Teens Survey

Grade	Female		Male	
	Number	Percentage	Number	Percentage
Race & Ethnicity				
<u>8th Grade</u>				
Native American	374	5.1	445	6.4
Asian	259	3.5	296	4.3
African American	245	3.3	292	4.2
Native Hawaiian	119	1.6	129	1.9
White	5720	77.6	5239	75.9
Multiple Races	650	8.8	501	7.3
Hispanic	720	9.8	606	8.8
Non-Hispanic	6647	90.2	6296	91.2
<u>11th Grade</u>				
Native American	169	3.1	218	4.3
Asian	173	3.2	176	3.5
African American	131	2.4	148	2.9
Native Hawaiian	61	1.1	89	1.8
White	4617	84.4	4184	82.7
Multiple Races	318	5.8	557	4.8
Hispanic	367	6.7	376	7.4
Non-Hispanic	5102	93.3	4682	92.6

The 11th grade version of the 2008 survey asked five additional questions assessing the frequency during the past 12 months that students (a) play cards for money, (b) bet money on games of personal skill like pool, golf, or bowling, (c) bet money on sports teams (d) bought lottery tickets or scratch offs, and (e) gamble at a casino. The response categories for each item were:

- A. Not at all
- B. Less than once a month
- C. About once a month
- D. About once a week
- E. Daily

RESULTS

Frequency of Gambling

Self-reported rates of gambling were similar for 8th grade and 11th grade girls. The three items asked of both grades each had a response category for not gambling. The percentage of female students responding that they do not bet for money, depending on item wording, was between 83 and 86 percent in 8th grade and between 82 and 87 percent in 11th grade. Rates of gambling were higher among boys than girls, with 30 to 33 percent of 8th graders and 32 to 40 percent of 11th graders reporting that they had gambled in the past year or past three months. Items asking 11th graders about the types of gambling they had participated in during the past year reveal that playing cards for money, betting on games of personal skill, and betting on sports teams are the most common forms of gambling in late adolescence. Boys gamble significantly more frequently than girls on cards, games of personal skill and on sports, but similar rates of gambling on games of chance (i.e., lottery tickets and scratch offs) were observed among boys and girls.

As with all survey assessments, the specific wording of items affects participants' responses. As a consequence, estimates of populations' participation in behaviors such as gambling are influenced by item wording. In the case of the 2008 OHT survey, the item asking how much money participants bet during the past 3 months produces slightly higher estimates of gambling prevalence than either of the items asking about betting during the past year. Specifically, 17% of 8th grade girls and 33% of 8th grade boys reported having bet at least \$1 during the past 3 months. As illustrated in Table 2, items asking about betting during the past year suggest a slightly lower prevalence of betting than reported during the past 3 months.

For the purpose of this study, the key 'outcome' variable was active gambling, defined as having bet at least \$1 during the past 3 months. While differences likely exist between individuals who bet only \$1 and persons who bet more than \$500 during the same period of time, there is value in better understanding youth who gamble - regardless of the level of their participation.

Table 2

Number and Percentage of Responses to Gambling Items by Gender and Grade

<u>Grade</u>	Girls		Boys	
	Number	Percentage	Number	Percentage
During the last 12 months, have you ever felt bad about the amount you bet, or about what happens when you bet money?				
<u>8th Grade</u>				
I don't bet for money	4485	84.6	3355	67.6
Yes	148	3.0	382	8.5
No	669	12.4	1157	23.9
<u>11th Grade</u>				
I don't bet for money	3073	87.0	2159	67.2
Yes	63	1.8	176	5.9
No	371	11.2	843	26.9
During the last 12 months, have you ever felt that you would like to stop betting money but didn't think you could?				
<u>8th Grade</u>				
I don't bet for money	4579	86.0	3461	70.0
Yes	82	1.6	190	4.3
No	650	12.5	1229	25.7
<u>11th Grade</u>				
I don't bet for money	3076	86.9	2177	68.4
Yes	40	1.4	98	3.5
No	392	11.7	898	28.2
In total, how much money have you bet in any form (lottery, cards, bingo, Internet, sports, with friends) in the past three months?				
<u>8th Grade</u>				
\$0	4424	83.0	3271	66.9
\$1 to \$10	596	11.3	855	17.6
\$11 to \$50	186	3.9	437	9.4
\$51 to \$100	54	1.2	147	3.1
\$101 to \$200	21	0.3	53	1.0
\$201 to \$500	9	0.1	27	0.4
Over \$500	15	0.2	82	1.6

<u>11th Grade</u>	Number	Percentage	Number	Percentage
\$0	2899	82.5	1912	59.9
\$1 to \$10	387	11.3	618	20.5
\$11 to \$50	148	4.2	385	11.5
\$51 to \$100	40	1.3	118	3.1
\$101 to \$200	18	0.3	66	2.1
\$201 to \$500	2	0.1	31	0.8
Over \$500	12	0.3	54	2.2

During the past 12 months, how often have you played cards for money?

11th Grade

Not at all	5203	89.3	3731	70.3
Less than once a month	464	8.0	1033	19.5
About once a month	103	1.8	324	6.1
About once a week	40	0.7	14	2.8
Daily	15	0.3	70	1.3

During the past 12 months, how often have you bet moneys on games of personal skill like pool, golf, or bowling?

11th Grade

Not at all	5240	90.1	3819	71.8
Less than once a month	434	7.5	926	17.4
About once a month	99	1.7	341	6.4
About once a week	32	0.6	172	3.2
Daily	12	0.2	61	1.1

During the past 12 months, how often have you bet money on sports teams?

11th Grade

Not at all	5328	91.7	3967	74.8
Less than once a month	370	6.4	911	17.2
About once a month	68	1.2	278	5.2
About once a week	35	0.6	102	1.9
Daily	12	0.2	46	0.9

During the past 12 months, how often have you bought lottery tickets or scratch offs?

11th Grade

Not at all	5251	90.3	4705	88.7
Less than once a month	384	6.6	349	6.6
About once a month	108	1.9	146	2.8
About once a week	57	1.0	77	1.5
Daily	14	0.2	28	0.5

During the past 12 months, how often have you gambled at a casino?

<u>11th Grade</u>	Number	Percentage	Number	Percentage
Not at all	5746	98.9	5130	96.9
Less than once a month	32	0.6	90	1.7
About once a month	13	0.2	41	0.8
About once a week	8	0.1	11	0.2
Daily	8	0.1	21	0.4

Bivariate Analyses

To assess the relationships between active gambling and the other risk and protective behaviors assessed in the 2008 OHT survey, a series of Chi-Square analyses were conducted. Both individual items and scales composed of groups of items (e.g., the Mental Health Inventory, MHI-5) were included in these analyses. Separate analyses were conducted for each of the four (gender x grade) cohorts. With the goal of developing multivariate logistic regression models to ‘predict’ active gambling, different cut points were utilized for each of the items and scales in an attempt to find the most statistically significant bivariate relationships. For example, the item assessing the language spoken most frequently in participants’ homes had three response categories (i.e., ‘English’, ‘Spanish’, and ‘Another language’). Initially, Chi-Square analysis examined the percent of participants who were active gamblers for each of the response categories. Subsequent analysis combined participants who spoke either ‘Spanish’ or ‘Another language’ into a single group and compared the rate of gambling in this group with that of participants who mostly spoke ‘English’ in their home. The bivariate analyses are summarized for each of the grade x gender cohorts in Appendices A and B. Several patterns of relationships emerged among the bivariate analyses:

- Race/ethnicity was not consistently associated with active gambling across the four cohorts. While rates of active gambling were significantly higher among Non-white than White 8th grade boys and 11th grade girls, non-significant relationships were observed in 8th grade girls and 11th grade boys. Active gambling was, however, significantly higher among youth who spoke a language other than English at home in all four cohorts.
- Self-rated physical health status was not consistently associated with active gambling. Conversely, in all four cohorts, youth who reported having unmet physical health care needs were significantly more likely to be active gamblers than youth who did not have unmet physical health care needs.
- Among 8th grade boys and girls, *poorer* self-reported mental health status and unmet mental health care needs were each associated with higher rates of active gambling. Oppositely, in 11th grade boys, *better* self-reported mental health status was associated with higher rates of active gambling.

- In 8th grade and 11th grade girls only, self-perceptions of being either over- or under-weight were associated with higher rates of active gambling relative to girls who felt their weight was about right.
- Lower rates of active gambling were observed in 8th grade boys and girls who met the state's Positive Youth Development benchmark and in 8th grade students with better school grades (i.e., average grade of B or better). Consistent relationships were not observed among these variables in 11th grade students.
- In both 8th grade and 11th grade boys, *higher* rates of gambling were observed among youth who reported higher levels of physical activity, and among boys who eat five servings of fruits or vegetables daily, than in boys who reported lower levels of physical activity and eating fewer fruits and vegetables. These otherwise healthy behaviors were positively associated with active gambling, a risk behavior.
- Eating breakfast daily, no soda consumption, no weeknight television viewing, and no video game/recreational computer use were each negatively associated with active gambling among all four cohorts.
- Significant relationships were consistently observed between active gambling and all of the assessed substance use and personal safety behaviors in all four of the (gender x grade) cohorts. Active gamblers were more likely to have used alcohol, tobacco, and illegal substances, sold illegal drugs, been in a car driven by a drunk driver, carried a weapon, been in a physical fight, stolen something worth more than \$10, suspended from school, and stopped by the police than non-gamblers.
- In addition to more frequent participation in risk behaviors including tobacco use, active gamblers reported lower perceptions of risk associated with tobacco use, higher perceived rates of smoking among youth their age, easier access to tobacco and alcohol, and lesser enforcement of school tobacco rules than non-gamblers.
- Active gamblers, in all four cohorts, reported significantly less strong personal, parental and community health beliefs, and lower levels of perceived social control in their neighborhoods than non-gamblers.

Multivariate Logistic Regression Models

Scale Development

The first step in creating multivariate logistic regression models was to develop scales for each of the domains assessed in the survey. The goal of the logistic regression analyses was to assess the combined and independent associations of the variables assessed in the 2008 OHT survey with active gambling among 8th and 11th grade girls and boys. Because of the high number of significant bivariate relationships, it was necessary to combine individual items into meaningful variables that reflect the protective and risk behaviors measured. Twelve variables included in one or more of the four final logistic regression models are described

below. Scales were created for additional variables, such as self-rated mental health, but are not described here because they did not contribute to any of the final models. The twelve measures included in the final models are as follows:

Health Status: good health status was classified according to the following seven criteria: 1) Excellent or very good physical health; 2) Excellent or very good emotional health; 3) Had a physical exam during the past 12 months; 4) No unmet physical health care needs during the past 12 months; 5) No unmet emotional health care needs during the past 12 months; 6) No asthma diagnosis; and, 7) No other chronic, physical, or emotional health condition, no physical or learning disability. Participants who recorded 5 or more of these criteria were classified as having good health, while participants reporting 4 or fewer of these criteria were classified as having poorer health.

Physical Activity: Participants who reported they were physically active for a total of at least 60 minutes per day for five more of the past seven days were classified as being high in physical activity. Participants who reported four or fewer days of physical activity were classified as being low active.

Sedentary Behavior: Participants responded to two items assessing how much time on an average school day they spent 1) watching television and 2) playing video and computer games or using a computer for something other than school work. Respondents reported the number of hours they engaged in each of these activities during a typical school day. The two items were summed into a single variable reflecting typical sedentary activity. Participants were placed into one of two categories: a) typically spends less than two hours in sedentary behavior, or b) typically spends at least two hours watching television or playing computer games daily.

Personal Safety: Participants who did not engage in behaviors that threatened their personal safety during the past 30 days were classified as having good personal safety. Participants who reported having engaged in one or more of the behaviors during the past 30 days were classified as low in personal safety. The personal safety behaviors assessed in the 2008 OHT survey included: 1) ride in a car or other vehicle driven by a teenager who had been drinking alcohol; 2) ride in a car or other vehicle driven by a parent or other adult who had been drinking alcohol; 3) carry a gun; 4) carry a weapon other than a gun, and 5) been in a physical fight.

Contact with Illegal and Antisocial Behavior: Participants who reported they were not affected by or did not engage in any potentially illegal or antisocial behavior in the past 12 months were classified as 'non-affected' while those that reported involvement in one or more of the behaviors were classified as 'had contact with antisocial behavior'. The behaviors included in this measure were: 1) has someone threatened you with a weapon such as a gun, knife, or club on school property; 2) been suspended from school; 3) anyone offered, sold or gave you an illegal drug on school property; 4) sold illegal drugs; 5) stolen or tried to steal a motor vehicle such as a car or motorcycle; 6) attacked someone with the idea of hurting them; 7) been arrested; 8) stolen something worth more than \$10; 9) been stopped by the police; 10) been in a fight with a weapon.

Alcohol Consumption: A single item was used to assess active alcohol consumption by participants. This item asked: 'On how many occasions (if any) have you had beer or wine (non-religious) or hard liquor (for example, vodka, whiskey, or gin) to drink during the past 30 days?' Respondents who reported they had not drunk alcohol during the past 30 days were categorized as non-consumers of alcohol, and all other respondents were classified as active alcohol consumers.

Peer Risk Behavior: Peer risk behavior was assessed by eleven items. These items asked participants to report whether, in the past 12 months, any of their four best friends had: 1) smoked cigarettes; 2) tried beer, wine, or hard liquor; 3) used marijuana; 4) used LSD, cocaine, amphetamines, or other illegal drugs; 5) sold illegal drugs; 6) carried a handgun; 7) been members of a gang; 8) dropped out of school; 9) been suspended from school; 10) stolen or tried to steal a motor vehicle such as a car or motorcycle; or 11) been arrested. Participants who reported their best friends had done one or none of the activities were categorized as having 'low peer risk behavior', and those who reported any of their four best friends had engaged in two or more of the behaviors were categorized as having 'high peer risk behavior' (Range = 0 – 11).

Personal Health Beliefs: Four items assessed participants' health beliefs. These items asked 'how wrong do you think it is for someone your age to': 1) smoke cigarettes; 2) drink beer, wine, or hard liquor; 3) smoke marijuana; and 4) use LSD, cocaine, amphetamines, or another illegal drug? Participants who responded 'very wrong' to each item were categorized as having strong personal health beliefs. Participants who responded either 'wrong', 'a little bit wrong', or 'not wrong at all' were categorized as having less strong personal health beliefs.

Harassment: A single item asked participants if they had experienced any harassment at school or on the way to or from school during the past 30 days. Harassment was defined as including threatening, bullying, name-calling or obscenities, offensive notes or graffiti, unwanted touching, and physical attacks. Participants who responded they had experienced harassment in relation to any issue (i.e., race/ethnicity, unwanted sexual attention, perceived sexual minority status, appearance, or friendship group) were categorized as having been harassed. Participants who responded they had not been harassed were categorized as non-harassed.

Tobacco Use: Participants who reported they had not used cigarettes, cigars, a pipe/hookah, bidi, or smokeless tobacco during the past 30 days were categorized as tobacco non-users. Participants who reported having used one or more of these forms of tobacco were categorized as tobacco-users.

Social Control: Four items assessed participants' perceptions of the level of social control in their neighborhood. These items asked:

- 1) If someone your age drank some beer, wine or hard liquor in your neighborhood, he or she would be caught by the police.
- 2) If someone your age tried to purchase alcohol at a store in your neighborhood, he or she would be asked for ID or proof of age.
- 3) If there were a party in your neighborhood where people your age were drinking, the police would come and break it up.

- 4) If someone your age asks people 21 or older in your neighborhood to buy alcohol for them, no one would buy it for them.

The response categories for each item were: a) very much true, b) pretty much true, c) a little true, and d) not at all true. On a scale from 4 to 16, with 16 reflecting that every item was very much true, a cut-point of 13 was used to categorize youth who reported they lived in neighborhoods with 'high social control'.

Sexual Intercourse: A single item was used to categorize whether each participant had ever had sexual intercourse.

Model Development

Step 1 - for each cohort, model construction started with the inclusion of the demographic variables (i.e., race, ethnicity, home language, school grade average) as 'predictors' of active gambling. At each subsequent step, variables were included in the model if bivariate analyses had shown the variable to be significantly associated with active gambling. Variables that did not make significant contributions to models were removed from subsequent models. The variables included at each step were as follows:

Step 2 - physical health, including oral health.

Step 3 - mental health (MHI-5, depression, suicidal ideation, and personal harassment)

Step 4 - positive youth development (PYD) benchmark

Step 5 - nutrition (i.e., consumption of 5 daily fruits or vegetables, milk and soda consumption, eating breakfast daily)

Step 6 - physical activity and sedentary behaviors

Step 7 - personal safety, contact with illegal and antisocial behavior, and peer risk behavior

Step 8 - sexual behavior

Step 9 - current tobacco, alcohol, and illegal drug use

Step 10 - family, personal, and community health beliefs, and neighborhood social control.

The goodness of fit of the multivariate logistic regression models was assessed using the Hosmer-Lemeshow Chi Square statistic. The Nagelkerke R Square statistic was also used as an index of the quality of the logistic regression models with an increase in the R Square suggesting an improvement in the model. The R Square statistic describes the amount of variance in the measure of active gambling predicted by the combination of 'predictor' variables. The contributions to the models of individual variables were assessed by odds ratios and P-values of each variable. Finally, the ability of the models to correctly classify active gamblers and non-gamblers was assessed using logistic regression classification analysis. The final models for each of the four (grade x gender) cohorts are presented below.

8th Grade Girls

The final logistic regression model for the sample of 8th grade girls included six predictor variables: sedentary behavior, personal safety behaviors, contact with illegal conduct, personal health beliefs, alcohol and tobacco use. The Hosmer-Lemeshow statistic was non-significant ($P=.07$) suggesting an adequate fit of the data to the model. The R Square statistic ($R\text{ Square} = 0.111$) showed that a relatively small amount of the variance in active gambling was explained by the combination of predictor variables. The individual variables contributing to this model suggest that eighth grade girls who report good personal safety habits, strong personal health beliefs, less than two hours of television or playing computer games on school nights, no current alcohol and tobacco use, and those who do not have contact with illegal behavior are less likely to gamble. Finally, the predictive accuracy of this model was 68.4%. Given that only 17% of 8th grade girls were classified as active gamblers, an 83.0% correct rate would be expected by chance alone. The sensitivity of the model was 58.2%, and the specificity was 70.2%. The model was therefore more accurate in identifying non-gamblers than gamblers. Overall, although the relationship between the predictor variables and active gambling are in the predicted directions, the combination of variables does not provide an effective predictor of active gambling among eighth grade girls.

Table 5. Logistic Regression Model for Active Gambling among 8th Grade Girls

Predictor	Odds Ratio (95% Confidence Interval)	P
Low sedentary behavior	0.78 (0.66-0.92)	.003
Good safety behaviors	0.46 (0.39-0.55)	.000
Strong personal health beliefs	0.56 (0.47-0.67)	.000
No contact with illegal behavior	0.63 (0.53-0.75)	.000
Current alcohol use	1.23 (1.02-1.47)	.027
Current tobacco use	0.71 (0.56-0.91)	.007

Hosmer-Lemeshow goodness-of-fit statistic: Chi Square=14.32, df=8, ($P=.074$)

Nagelkerke R Square: 0.111

Predictive accuracy: percent correct=68.4%; sensitivity=58.2%; specificity=70.2%

8th Grade Boys

Seven predictor variables were included in the final logistic regression model for 8th grade boys. The Hosmer-Lemeshow statistic shows that the data adequately fits the model. Eighth grade boys who report good personal safety habits, no involvement in illegal activities, low peer risk behavior, strong personal health beliefs, and living in neighborhoods with strong social control are less likely to gamble. Conversely, eighth grade boys who participate in frequent (i.e., at least five days per week) physical activity and boys who currently use alcohol are more likely to have gambled during the past three months. The predictive accuracy of the final model was 66.6% which is very slightly better than chance alone (33.1% of 8th grade boys were active gamblers). The sensitivity of the model was 60.7%, and the specificity 69.2%. The model was therefore more accurate in identifying non-gamblers than active gamblers.

Table 6. Logistic Regression Model for Active Gambling among 8th Grade Boys

Predictor	Odds Ratio (95% Confidence Interval)	P
High physical activity	1.35 (1.16-1.56)	.000
Good safety behaviors	0.53 (0.46-0.62)	.000
No contact with illegal behavior	0.62 (0.53-0.72)	.000
Current alcohol use	1.29 (1.09-1.53)	.003
Low peer risk behavior	0.80 (0.67-0.94)	.007
Strong personal health beliefs	0.64 (0.55-0.75)	.000
High neighborhood social control	0.75 (0.65-0.87)	.000

Hosmer-Lemeshow goodness-of-fit statistic: Chi Square=8.27, df=8, (P=.408)

Nagelkerke R Square: 0.146

Predictive accuracy: percent correct=66.6%; sensitivity=60.7%; specificity=69.2%

11th Grade Girls

The final logistic regression model for the sample of 11th grade girls included seven predictor variables: physical activity participation, personal safety behaviors, contact with illegal behavior, harassment, sexual behavior, active alcohol use, and peer risk behavior. However, the Hosmer-Lemeshow statistic suggests that the data did not fit the model well, and the R Square statistic (R Square = 0.09) showed that a low amount of the variance in active gambling was explained by the combination of predictor variables. The individual variables contributing to this model show that eleventh grade girls who report good personal safety habits, no contact with or participation in illegal behavior, having friends who engage in few risk behaviors (e.g., sold illegal drugs, dropped out of school), non-users of alcohol, and who have not had sexual intercourse are less likely to be active gamblers. Frequent physical activity participation and having been harassed in the past 30 days were significant predictors of active gambling. The predictive accuracy of this model was 61.5% (17.5% were active gamblers). The sensitivity was 65.9%, and the specificity was 60.5%.

Table 7. Logistic Regression Model for Active Gambling among 11th Grade Girls

Predictor	Odds Ratio (95% Confidence Interval)	P
High physical activity	1.31 (1.12-1.53)	.001
Good safety behaviors	0.56 (0.47-0.66)	.000
No contact with illegal behavior	0.63 (0.52-0.75)	.000
Current alcohol use	1.49 (1.25-1.78)	.000
Low peer risk behavior	0.71 (0.59-0.85)	.000
Been harassed in past 30 days	1.22 (1.04-1.44)	.017
Ever had sexual intercourse	0.76 (0.64-0.90)	.002

Hosmer-Lemeshow goodness-of-fit statistic: Chi Square=16.29, df=8, (P=.038)

Nagelkerke R Square: 0.088

Predictive accuracy: percent correct=61.5%; sensitivity=65.9%; specificity=60.5%

11th Grade Boys

The Hosmer-Lemeshow statistic (Chi Square=9.59, P=.30) for the 11th grade boys' final model showed an adequate fit of the data to the model. The individual variables contributing to this model demonstrate that among eleventh grade boys, active gambling was less common among those who reported good personal safety habits, no involvement in illegal behavior, friends who engaged in few risk behaviors, strong personal health beliefs, and not having used alcohol or tobacco in the past 30 days. Healthy eleventh grade boys who frequently participated in physical activity were more likely to have gambled during the past three months than those that reported poorer health status or lesser participation in physical activity. Finally, boys who had experienced harassment during the past 30 days were more likely to have gambled than those who had not been harassed. The predictive accuracy of the model for eleventh grade boys was 63.4% (40.1% of 11th grade boys were active gamblers). The sensitivity was 65.2 %, and the specificity was 62.3%, hence the model was slightly better at predicting active gamblers than non-gamblers.

Table 8. Logistic Regression Model for Active Gambling among 11th Grade Boys

Predictor	Odds Ratio (95% Confidence Interval)	P
Good health status	1.56 (1.33-1.83)	.000
High physical activity	1.59 (1.37-1.85)	.000
Good safety behaviors	0.64 (0.55-0.75)	.000
No contact with illegal behavior	0.62 (0.52-0.72)	.000
Current alcohol use	1.21 (1.02-1.44)	.025
Low peer risk behavior	0.78 (0.66-0.92)	.003
Strong personal health beliefs	0.64 (0.54-0.77)	.000
Been harassed in past 30 days	1.20 (1.01-1.42)	.035
Current tobacco use	1.26 (1.06-1.52)	.011

Hosmer-Lemeshow goodness-of-fit statistic: Chi Square=8.03, df=8, (P=.430)

Nagelkerke R Square: 0.145

Predictive accuracy: percent correct=63.4%; sensitivity=65.2%; specificity=62.3%

DISCUSSION

Prevention and intervention strategies designed to address different problem behaviors often treat each behavior (e.g., tobacco use, drinking and driving) as separate health issues. From this perspective, a gambling prevention program would focus solely on gambling and might educate students about the risks involved in gambling and teach behavioral strategies intended to reduce the likelihood of future gambling. An alternative strategy is to target clusters of risk behaviors for prevention and treatment (Parker et al., 2008). From this perspective, gambling prevention would be included in a broader health promotion program that focused on multiple related health risks and protective factors. In order to hone this

approach, it may be useful to determine which behaviors are correlated at different developmental stages.

The current analysis suggests some possible considerations for the latter approach as alcohol use, personal safety behaviors (i.e., riding in a car driven by a person who has been drinking alcohol, carrying a gun or other weapon, being in a physical fight), and involvement in illegal behavior were significant predictors of active gambling in all four cohorts. Additionally, peer risk behavior, and personal health beliefs were independently associated with active gambling in three of the four cohorts. The consistency of these relationships suggests that a school-based intervention directed at all of the behaviors represented in the variables would be appropriate for both 8th grade and 11th grade classes. The data do not support an approach that would partner gambling prevention solely with one specific other behavior (e.g., alcohol or illegal drug use) because of the number of significant relationship between active gambling and other behaviors.

Frequent participation in physical activity contributed to three of the four final models (not 8th grade girls). This otherwise health-enhancing behavior was positively associated with active gambling. Hence, programs that divert middle school and high school aged youth into physical activity programs would be unlikely to prevent gambling. This finding does suggest however that one possible population for gambling prevention programs would be youth that participate in athletic programs. Sensation-seeking youth (Gupta & Derevensky, 1998; Vitaro et al., 2001) may be drawn to both participate in athletics programs and to gambling. This may be a fruitful population for gambling prevention programming, especially given the prevalence of gambling on games of skill and sports events.

In the logistic regression models for 11th grade boys and girls, having experienced harassment during the past 30 days was predictive of active gambling. The mechanisms that link harassment experiences with gambling seem worthy of study as it is not obvious why people who have experienced harassment would be more likely to gamble. In the 11th grade sample of boys, better self-rated mental health was positively associated with active gambling. However, there is a strong negative linear relationship between harassment experiences and mental health.

These findings are consistent with the only other significant study of youth gambling in Oregon, which was completed by Dr. Rachel Volberg in 2008. Ongoing efforts to collect and analyze such data are warranted because of their promise to help shape prevention and treatment programs and, ultimately, to enhance the lives of Oregonians.

LIMITATIONS

A number of limitations exist in the current analysis. Notably, the analysis relies upon self-reported data. Despite internal reliability checks and removal of 6% of surveys because of series of “dubious” answers, the possibility of participants misunderstanding items, inaccurately recalling events, and responding with social desirability response sets results in likely inaccurate responses. For example, twenty-nine 11th grade students reported very

frequent (i.e., daily) gambling in casinos. Given the locations of the schools these students attended relative to the locations of Oregon's casinos (and the active enforcement of prohibitions against youth gambling at tribal casinos) it is unlikely that these students' reports are accurate. It is possible, however, that students reporting gambling at casinos are referring to on-line casinos. Regardless of the explanation for these individuals' responses, there is likely significant error in participants' responses to all items contained in the OHT survey. Additionally, missing data (i.e., from missing responses and incorrectly marked surveys) are not normally distributed throughout the survey. It is possible that the relationships observed in the data may be affected by missing data.

The second main limitation of this analysis is that the cross-sectional nature of OHT data prevents drawing causal conclusions for the observed associations. The nature of the relationships between gambling and the associated variables are not clear. Specifically, it is not clear whether gambling is (a) a consequence of other risk behaviors (e.g., alcohol use), (b) a predictor of other risk behaviors, or (c) if bi-directional relationships exist whereby early gambling experiences encourage subsequent adolescent experimentation with other risk behaviors and participation in other risk behaviors increases the likelihood of later gambling. Longitudinal data is necessary to learn more about the nature of these relationships.

REFERENCES

Abbott, M.W., Volberg, R.A., Bellringer, M., & Reith, G. (2004). *A Review of Research on Aspects of Problem Gambling*. Report to the Responsibility in Gambling trust. Auckland, NZ: Gambling Research centre, Auckland University of Technology.

Blaszczynski, A., & Steel, Z. (1998). Personality disorders among pathological gamblers. *Journal of Gambling Studies*, *14*, 51-71.

Chambers, R.A., Taylor, J.R., & Potenza, M.N., (2003). Developmental neurocircuitry of motivation in adolescence: A critical period of addiction vulnerability. *American Journal of Psychiatry*, *160*, 1041-1052.

Cox, S., Lesieur, H.R., Rosenthal, R.J., & Volberg, R.A. (1997). *Problem and Pathological Gambling in America: The National Picture*. Columbia, MD: National Council on Problem Gambling.

Crockford, D.N., & el-Guebaly, N. (1998). Psychiatric comorbidity in pathological gambling: a critical review. *Canadian Journal of Psychiatry – Review of Canadian Psychiatry*, *43*, 43-50.

Cunningham-Williams, R., Cttler, L.B., Compton, W.M., & Spitznagel, E.L. (1998). Taking chances: problem gamblers and mental health disorders – results from the St. Louis epidemiologic catchment area study. *American Journal of Public Health*, *88*, 1093-1096.

Custer, R.L., & Milt, H. (1985). *When Luck Runs Out: Help for Compulsive Gamblers and Their Families*. New York: Facts on File.

Dishion, T.J., French, D.C., & Patterson, G.R. (1995). The development and ecology of antisocial behavior. In D. Cicchetti, & D.J. Cohen (Eds.), *Developmental Psychopathology* (pp.421-471). New York: John Wiley and Sons.

Ellickson, P.L., Hays, R.D., & Bell, R.M. (1992). Stepping through the drug use sequence: Longitudinal scalogram analysis of initiation and regular use. *Journal of Abnormal Psychology, 101*, 441-451.

Felsher, J., Derevensky, J., & Gupta, R. (2003). Parental influence and social modeling of youth lottery participation. *Journal of Community and Applied Social Psychology, 13*, 361-377.

Fisher, S. (1993). Gambling and pathological gambling in adolescents. *Journal of Gambling Studies, 9*, 257-288.

Gerstein, D., Murphy, S., & Toce, M., Hoffmann, J., Palmer, A., et al. (1999). *Gambling Impact and Behavior Study: Report to the National Gambling Impact Study Commission*. Chicago: National Opinion Research Center.

Gupta, R. & Derevensky, J. (1998). Adolescent gambling behavior: a prevalence study and examination of the correlates associated with problem gambling. *Journal of Gambling Studies, 14(4)*, 319-345.

Jacobs, D.F. (2000). Juvenile gambling in North America: An analysis of long-term trends and future prospects. *Journal of Gambling Studies, 16(2/3)*, 119-152.

Jacobs, D.F., Marston, A.R., Singer, R.D., Widaman, K., Little, T., Veizades, J. (1989). Children of problem gamblers. *Journal of Gambling Behavior, 5*, 261-267.

Langhinrichsen-Rohling, J., Rohde, P., Seeley, J.R., & Rohling, M.L. (2004). Individual, family, and peer correlates of adolescent gambling. *Journal of Gambling Studies, 20*, 23-46.

Lesieur, H.R., & Heineman, M. (1988). Pathological gambling among multiple substance abusers in a therapeutic community. *British Journal of Addiction, 83*, 765-71.

Lorenz, V.C., & Yaffee, R. (1988). Pathological gambling: psychosomatic, emotional and marital difficulties as reported by the spouse. *Journal of Gambling Behavior, 4*, 13-26.

Magoon, M.E., Gupta, R., & Derevensky, J. (2005). Juvenile delinquency and adolescent gambling: Implications for the juvenile justice system. *Criminal Justice and Behavior, 32(6)*, 690-713.

McCleary R, Chew, K., Feng, W., Merrill, V., Napolitano, C., et al. (1998). *Suicide and Gambling: An analysis of Suicide Rates in U.S. Counties and Metropolitan Areas*. Irvine, CA: University of California at Irvine, School of Social Ecology.

McCormick, R.A., Russo, A.M., Ramirez, L.F., & Taber, J.I. (1984). Affective disorders among pathological gamblers seeking treatment. *American Journal of Psychiatry*, *141*, 215-218.

Messerlian, C., Derevensky, J. & Gupta, R. (2005). Youth gambling problems: A public health perspective. *Health Promotion International*, *20*, 69-79.

Moore, T. (2001). *Older Adult Gambling in Oregon: An Epidemiological Survey*. Salem, OR: Oregon Gambling Addiction Treatment Foundation.

Moore, T. (2006). *The prevalence of disordered gambling among adults in Oregon: a replication study*. Salem, OR: Oregon Gambling Addiction Treatment Foundation.

National Gambling Impact Study Commission. (1999). *National Gambling Impact Study Commission Report*. Washington, DC: National Gambling Impact Study Commission.

National Research Council. (1999). *Pathological Gambling: A Critical Review*. Washington, DC: National Academy Press.

Oregon, Department of Human Services, Addictions and Mental Health Division (2009). *2009 Oregon Problem Gambling Community Resource Guide*, Salem, OR.

Parker, J.D.A., Taylor, R.N., Eastabrook, J.M., Schell, S.L., & Wood, L.M. (2008). Problem gambling in adolescence: Relationships with internet misuse, gaming abuse and emotional intelligence. *Personality and Individual Differences*, *45*, 174-180.

Shaffer, H.J. & Hall, M.N. (1996). Estimating prevalence of adolescent gambling disorders: A quantitative synthesis and guide toward standard gambling nomenclature. *Journal of Gambling Studies*, *12*, 193-214.

Shaffer, H.J. & Hall, M.N. (2001). Updating and refining prevalence estimates of disordered gambling behaviour in the United States and Canada. *Canadian Journal of Public Health*, *92*, 68-72.

Shaffer, H.J. & Hall, M.N. (2002). The natural history of gambling and drinking problems among casino employees. *Journal of Social Psychology*, *142*, 405-424.

Slutske, W.S., Jackson, K.M., & Sher, K.J. (2003). The natural history of problem gambling from age 18 to 29. *Journal of Abnormal Psychology*, *112*, 263-274.

Stinchfield, R., Cassuto, N., Winters, K.C. & Latimer, W. (1997). Prevalence of gambling among Minnesota public school students in 1992 and 1995. *Journal of Gambling Studies*, *13*(1), 25-48.

Stinchfield, R. & Winters, K.C. (1998). Gambling and problem gambling among youths. *Annals of the American Academy of Political and Social Science*, *556*, 172-185.

Stinchfield, R. & Winters, K.C. (2002). Outcomes of Minnesota's gambling treatment programs. *Journal of Gambling Studies*, *17*, 217-245.

- Vachon, J., Vitaro, F., Wanner, B., & Tremblay, R.E. (2001). Adolescent gambling: Relationships with parent gambling and parental practices. *Psychology of Addictive Behaviors, 18*, 398-401.
- Vitaro, F., Brendgen, M., Ladouceur, R., & Tremblay, R.E. (2001). Gambling, delinquency, and drug use during adolescence. *Journal of Gambling Studies, 17*, 171-190.
- Volberg, R.A. (1994). The prevalence and demographics of pathological gamblers: Implications for public health. *American journal of Public Health, 84*(2), 237-241.
- Volberg, R.A. (2002). The epidemiology of pathological gambling. *Psychiatry Annals, 32*, 171-178.
- Volberg, R.A., Hedberg, E.C., & Moore, T.L. (2008). *Oregon Youth and Their Parents: Gambling and Problem Gambling Prevalence and Attitudes*. Northampton, MA: Gemini Research, Ltd.
- Wanner, B., Vitaro, F., Ladouceur, R., Brendgen, M., & Tremblay, R.E. (2006). Joint trajectories of gambling, alcohol and marijuana use during adolescence: A person- and variable-centered developmental approach. *Addictive Behaviors, 31*, 566-580.
- Wildman, R.W. (1989). Pathological gambling: Marital-familial factors, implications, and treatments. *Journal of Gambling Behavior, 5*, 293-301.
- Winters, K.C., Stinchfield, R.D., & Fulkerson, J. (1993). Patterns and characteristics of adolescent gambling. *Journal of Gambling Studies, 9*, 63-82.
- Winters, K.C., Stinchfield, R., Botzet, A., & Anderson, N. (2002). A prospective study of youth gambling behaviors. *Psychology of Addictive Behaviors, 16*, 3-9.
- Winters, K.C., Stinchfield, R.D., Botzet, A., & Slutske, W.S. (2005). Pathways of youth gambling problem severity. *Psychology of Addictive Behaviors, 19*(1), 104-107.
- Wynne, H., Smith, G., & Jacobs, D. (1996). *Adolescent gambling and problem gambling in Alberta*. Edmonton, Alberta, Canada: Alberta Alcohol and Drug Abuse Commission.

Appendix A. Bivariate Analyses of Variables Associated with Active Gambling
among Female and Male 8th Grade Students

Variable	8 th Grade (n=15,865)			
	Female Non Gamblers (n=6,888) 83.4%	Female Active Gamblers (n= 1,372) 16.6%	Male Non Gamblers (n=5,105) 67.1%	Male Active Gamblers (n=2,500) 32.9%
Race				
White	(5326) 84.5	(979) 15.5	(3834) 68.9	(1728) 31.1***
Non-white	(837) 82.2	(181) 17.8	(735) 63.1	(429) 36.9
Language spoken in home				
English	(6071) 84.2	(1140) 15.8***	(4455) 67.9	(2107) 32.1**
Other language	(733) 77.2	(216) 22.8	(593) 62.8	(351) 37.2
BMI				
Normal	(4918) 83.7	(957) 16.3*	(3322) 67.1	(1629) 32.9
Overweight or Obese	(1,354) 81.6	(305) 18.4	(1,409) 67.1	(691) 32.9
Self-rated physical health				
Excellent	(1116) 85.3	(193) 14.7***	(1249) 65.7	(653) 34.3
Very good	(2475) 85.1	(435) 14.9	(1871) 66.6	(938) 33.4
Good	(2586) 82.5	(549) 17.5	(1533) 68.8	(694) 31.2
Fair	(598) 79.0	(159) 21.0	(382) 68.5	(176) 31.5
Poor	(80) 72.1	(31) 27.9	(46) 63.9	(26) 36.1
Self-rated mental health				
Excellent	(1471) 86.3	(233) 13.7***	(1588) 70.6	(660) 29.4***
Very good	(2285) 84.3	(424) 15.7	(1848) 67.1	(908) 32.9
Good	(2029) 83.5	(401) 16.5	(1189) 66.1	(611) 33.9
Fair	(783) 79.0	(208) 21.0	(354) 61.8	(219) 38.2
Poor	(267) 74.8	(90) 25.2	(87) 53.4	(76) 46.6
Most recent check-up when not sick				
During last 12 months	(3238) 84.4	(599) 15.6*	(2403) 66.6	(1203) 33.4
More than 12 months or unsure	(3597) 82.5	(762) 17.5	(2640) 67.5	(1274) 32.5
Unmet physical health care needs				
Yes	(1410) 78.2	(394) 21.8***	(723) 60.0	(483) 40.0***
No	(5360) 84.8	(960) 15.2	(4292) 68.6	(1965) 31.4
Unmet mental health care needs				
Yes	(1185) 79.0	(315) 21.0***	(409) 61.0	(261) 39.0***
No	(5583) 84.2	(1045) 15.8	(4585) 67.7	(2184) 32.3
PYD Benchmark				
Met	(4390) 85.0	(775) 15.0***	(3321) 69.4	(1467) 30.6***
Did not meet	(2271) 80.6	(547) 19.4	(1590) 63.3	(922) 36.7
School Grades				
High (average B or higher)	(5024) 84.6	(914) 15.4***	(3266) 68.4	(1511) 31.6***
Low (C or lower)	(1369) 78.9	(367) 21.1	(1422) 64.2	(792) 35.8

* p < .05 ** p < .01 *** p < .001

Variable	Female Non Gamblers (n=6,888) 83.4%	Female Active Gamblers (n= 1,372) 16.6%	Male Non Gamblers (n=5,105) 67.1%	Male Active Gamblers (n=2,500) 32.9%
Injured in mouth playing sports in past year				
Yes	(1369) 76.7	(415) 23.3***	(1306) 57.8	(952) 42.2***
No	(5216) 85.3	(900) 14.7	(3546) 71.3	(1429) 28.7
Asthma diagnosis ever				
Yes or not sure	(1675) 81.4	(384) 18.6**	(1252) 64.9	(676) 35.1*
No	(5180) 84.1	(981) 15.9	(3813) 67.9	(1801) 32.1
Other chronic health conditions (inc., developmental, sensory, emotional, learning disorders)				
None	(4,72) 84.7	(809) 15.3***	(3,33) 67.8	(1,27) 32.2*
One or more	(2229) 80.9	(525) 19.1	(1494) 65.5	(786) 34.5
Five daily servings of fruits or vegetables				
Yes	(1319) 81.9	(291) 18.1	(1017) 63.8	(577) 36.2**
No	(5458) 83.9	(1051) 16.1	(3940) 67.9	(1017) 32.1
Two or more glasses of milk daily				
Yes	(2340) 82.8	(485) 17.2	(2306) 65.8	(1200) 34.2*
No	(4513) 83.7	(880) 16.3	(2743) 68.2	(1279) 31.8
Ate breakfast each of past seven days				
Yes	(2,693) 86.6	(416) 13.4***	(2,657) 71.1	(1,080) 28.9***
No	(4,131) 81.4	(946) 18.6	(2,386) 63.2	(1,391) 36.8
Drank soda during past 7 days				
Any	(5,018) 82.1	(1094) 17.9***	(3,983) 65.4	(2,110) 34.6***
None	(1,851) 87.2	(1,851) 12.8	(1,089) 74.5	(373) 25.5
Days with 60+ mins. physical activity in typical week				
0	(552) 84.9	(98) 15.1*	(294) 71.0	(120) 29.0***
1	(462) 85.6	(78) 14.4	(238) 69.6	(104) 30.4
2	(584) 82.4	(125) 17.6	(342) 70.5	(143) 29.5
3	(847) 84.3	(158) 15.7	(478) 71.6	(190) 28.4
4	(878) 84.7	(159) 15.3	(510) 69.5	(224) 30.5
5	(1,163) 83.9	(223) 16.1	(799) 68.9	(361) 31.1
6	(691) 82.7	(145) 17.3	(514) 64.6	(282) 35.4
7	(1,648) 81.6	(371) 18.4	(1,881) 64.0	(1,057) 36.0
Weeknight television viewing				
None	(874) 88.0	(119) 12.0***	(596) 72.8	(223) 27.2***
Any	(5,943) 82.8	(1,234) 18.1	(5,943) 82.8	(1,234) 17.2
Video games and computer use not for school				
None	(1,483) 87.5	(212) 12.5***	(685) 72.2	(264) 27.8***
Any	(5,313) 82.4	(1,137) 17.6	(4,331) 66.4	(2,188) 33.6

Variable	Female Non Gamblers (n=6,888) 83.4%	Female Active Gamblers (n= 1,372) 16.6%	Male Non Gamblers (n=5,105) 67.1%	Male Active Gamblers (n=2,500) 32.9%
Self-perception of weight				
Underweight or underweight	(2980) 81.1	(695) 18.9***	(2155) 67.2	(1052) 32.8
About right	(3808) 85.4	(650) 14.6	(2881) 67.2	(1409) 32.8
Mental health status (MHI-5)				
High (25-30)	(2800) 86.3	(446) 13.7***	(2875) 70.6	(1196) 29.4***
Low (5-24)	(3784) 81.3	(870) 18.7	(1961) 62.9	(1158) 37.1
Did you ever feel sad, stop usual activities in past 12 months				
Yes	(1399) 77.7	(401) 22.3***	(542) 58.9	(378) 41.1***
No	(5293) 84.9	(938) 15.1	(4383) 68.7	(1996) 31.3
Ever seriously consider attempting suicide in past 12 months				
Yes	(1220) 76.3	(378) 23.7***	(444) 58.5	(315) 41.5***
No	(5608) 85.2	(974) 14.8	(4602) 68.1	(2151) 31.9
Ride in car driven by teenager who had been drinking alcohol, in past 30 days				
Yes	(390) 64.9	(211) 35.1***	(220) 43.1	(290) 56.9***
No	(6425) 85.0	(1137) 15.0	(4801) 68.8	(2471) 31.2
Did not go to school because felt unsafe				
No days	(6485) 83.9	(1243) 16.1***	(4887) 68.2	(2281) 31.8***
One or more days	(386) 75.4	(126) 24.6	(192) 48.1	(207) 51.9
Carried a gun or other weapon in past 30 days				
No days	(6328) 85.7	(1053) 14.3***	(4004) 73.3	(1457) 26.7***
One or more days	(528) 63.6	(302) 36.4	(1049) 51.2	(999) 48.8
In a physical fight during past 12 months				
None	(5348) 87.9	(736) 12.1***	(3443) 75.6	(1110) 24.4***
One or more times	(1474) 70.9	(604) 29.1	(1566) 53.9	(1339) 46.1
Suspended from school in past 12 months				
None	(6138) 84.4	(1132) 15.6***	(4093) 70.6	(1707) 29.4***
One or more times	(714) 75.6	(230) 24.4	(977) 56.4	(755) 43.6
Been offered, sold or given illegal drug on school property by anyone in past 12 months				
None	(6,185) 85.0	(1093) 15.0***	(4637) 70.0	(1990) 30.0***
One or more times	(681) 71.6	(270) 28.4	(427) 47.3	(476) 52.7

Variable	Female Non Gamblers (n=6,888) 83.4%	Female Active Gamblers (n= 1,372) 16.6%	Male Non Gamblers (n=5,105) 67.1%	Male Active Gamblers (n=2,500) 32.9%
Times you sold illegal drugs in past 12 months				
None	(6693) 84.0	(1276) 16.0***	(4918) 68.9	(2217) 31.1***
One or more times	(173) 66.5	(87) 33.5	(158) 39.7	(240) 60.3
Attacked someone with the idea of seriously hurting them				
None	(6313) 85.5	(1074) 14.5***	(4545) 70.4	(1911) 29.6***
One or more times	(545) 65.0	(293) 35.0	(521) 48.4	(555) 51.6
Stolen something worth more than \$10 in past 12 months				
No	(5874) 86.1	(951) 13.9***	(4260) 73.0	(1575) 27.0***
Yes	(981) 70.4	(412) 29.6	(806) 47.7	(884) 52.3
Stopped by the police in the past 12 months				
No	(5688) 86.2	(914) 13.8***	(3821) 73.7	(1364) 26.3***
Yes	(1166) 72.3	(446) 27.7	(1247) 53.0	(1106) 47.0
Ever had sexual intercourse				
No	(5871) 85.3	(1012) 14.7***	(4231) 70.6	(1765) 29.4***
Yes	(943) 74.0	(331) 26.0	(807) 54.4	(676) 45.6
Active tobacco user				
No	(6181) 84.5	(1132) 15.5***	(4659) 69.5	(2044) 30.5***
Yes	(619) 74.0	(217) 26.0	(327) 45.7	(389) 54.3
Illegal drug use in past 30 days				
No	(4975) 85.5	(844) 14.5***	(3595) 70.5	(1507) 29.5***
Yes	(679) 73.2	(249) 26.8	(381) 50.1	(380) 49.9
Smoke from other people's cigarettes is harmful to you				
Definitely yes	(5077) 85.5	(858) 14.5***	(3622) 69.9	(1562) 30.1***
Probably yes	(1044) 77.9	(296) 22.1	(733) 60.9	(470) 30.1
Probably not	(202) 69.2	(90) 30.8	(150) 51.9	(139) 48.1
Definitely not	(150) 84.4	(28) 15.6	(128) 57.9	(93) 42.1
Do you think you will smoke a cigarette at any time during the next year?				
Definitely not	(4956) 87.6	(699) 12.4***	(3929) 72.3	(1502) 27.7***
Probably not	(870) 75.5	(283) 24.5	(513) 54.7	(425) 45.3
Probably yes	(243) 68.6	(111) 31.4	(124) 53.0	(110) 47.0
Definitely yes	(59) 66.3	(30) 33.7	(75) 60.5	(49) 39.5

* p < .05 ** p < .01 *** p < .001

Variable	Female Non Gamblers (n=6,888) 83.4%	Female Active Gamblers (n= 1,372) 16.6%	Male Non Gamblers (n=5,105) 67.1%	Male Active Gamblers (n=2,500) 32.9%
What percentage of your grade do you think smoked in the past 30 days?				
< 10%	(2375) 86.9	(359) 13.1***	(2248) 71.2	(909) 28.8***
11% to 20%	(1353) 82.9	(280) 17.1	(966) 66.2	(493) 33.8
21% to 30%	(902) 82.8	(187) 17.2	(511) 64.4	(282) 35.6
31% to 40%	(682) 82.3	(147) 17.7	(359) 61.8	(222) 38.2
41% to 50%	(446) 78.7	(121) 21.3	(207) 61.2	(131) 38.8
51% to 60%	(275) 77.7	(79) 22.3	(136) 62.1	(83) 37.9
61% to 70%	(170) 80.2	(42) 19.8	(67) 52.3	(61) 47.7
More than 70%	(189) 79.1	(50) 20.9	(83) 52.9	(74) 47.1
If one of your best friends offered you a cigarette, would you smoke it?				
Definitely not	(48 13) 87.9	(663) 12.1***	(3839) 73.0	(1419) 27.0***
Probably not	(910) 76.0	(288) 24.0	(529) 52.1	(486) 47.9
Probably yes	(256) 66.1	(131) 33.9	(130) 53.3	(114) 46.7
Definitely yes	(135) 78.5	(37) 21.5	(128) 66.7	(64) 33.3
If you wanted to get some tobacco, how easy would it be for you to get some?				
Very hard	(2551) 90.3	(275) 9.7***	(1938) 80.1	(482) 19.9***
Sort of hard	(909) 84.6	(166) 15.4	(560) 65.4	(296) 34.6
Sort of easy	(1254) 78.4	(346) 21.6	(801) 60.8	(517) 39.2
Very easy	(1738) 77.6	(501) 22.4	(1402) 57.8	(1022) 42.2
Is there a rule against tobacco in your school?				
Rule is strictly enforced	(5189) 84.6	(941) 15.4***	(3855) 69.1	(1727) 30.9***
Rule sometimes enforced	(909) 80.2	(225) 19.8	(555) 62.3	(336) 37.7
Is rule, but it isn't enforced	(255) 77.7	(73) 22.3	(174) 55.1	(142) 44.9
There is no rule	(198) 81.1	(46) 18.9	(197) 63.3	(114) 36.7
Does someone living in your house (other than you) smoke cigarettes?				
Nobody smokes	(4172) 85.0	(734) 15.0***	(3145) 69.1	(1404) 30.9***
Smokes, but not in house	(1815) 81.8	(404) 18.2	(1194) 65.0	(643) 35.0
Smokes in the house	(554) 79.7	(141) 20.3	(384) 63.4	(222) 36.6
Days with at least one drink of alcohol in past 30 days				
None	(4603) 87.7	(648) 12.3***	(3590) 73.3	(1311) 26.7***
One or more	(1703) 73.9	(600) 26.1	(943) 51.6	(883) 48.4
* p < .05	** p < .01	*** p < .001		

Variable	Female Non Gamblers (n=6,888) 83.4%	Female Active Gamblers (n= 1,372) 16.6%	Male Non Gamblers (n=5,105) 67.1%	Male Active Gamblers (n=2,500) 32.9%
If you wanted to get some beer, wine, etc. how easy would it be for you to get some?	(1488) 92.4	(123) 8.6***	(1211) 79.4	(315) 20.6***
Very hard				
Sort of hard	(1027) 86.2	(164) 13.8	(752) 70.5	(315) 29.5
Sort of easy	(1612) 80.6	(389) 19.4	(1015) 64.5	(559) 35.5
Very easy	(1983) 78.6	(540) 21.4	(1380) 58.6	(976) 41.4
Parent health beliefs				
Strong (cigarettes, alcohol, marijuana very wrong)	(3,582) 87.2	(525) 12.8***	(2595) 73.2	(949) 26.8***
Less strong	(1807) 77.8	(515) 22.2	(1178) 57.5	(869) 42.5
Personal health beliefs				
Strong (cigarettes, alcohol, marijuana very wrong)	(3070) 90.0	(342) 10.0***	(2,396) 76.3	(744) 23.7***
Less strong	(2243) 76.7	(680) 23.3	(1335) 56.0	(1050) 44.0
Community health beliefs				
Strong (cigarettes, alcohol, marijuana very wrong)	(2796) 86.6	(432) 13.4***	(2167) 72.3	(832) 27.7***
Less strong	(2433) 80.4	(593) 19.6	(1535) 62.4	(924) 37.6
Social control				
Strong (13-16)	(2114) 87.8	(295) 12.2***	(1795) 74.7	(607) 25.3***
Less strong (4-12)	(2996) 81.2	(692) 18.8	(1819) 61.7	(1130) 38.3

* p < .05

** p < .01

*** p < .001

Appendix B. Bivariate Analyses of Variables Associated with Active Gambling
among Female and Male 11th Grade Students

Variable	11 th Grade (n=11,061)			
	Female Non Gamblers (n=4,755) 82.2%	Female Active Gamblers (n=1,032) 17.8%	Male Non Gamblers (n=3,166) 60.0%	Male Active Gamblers (n=2,108) 40.0%
Race				
White	(3905) 82.9	(807) 17.1*	(2516) 60.6	(1636) 39.4
Non-white	(424) 79.1	(112) 20.9	(357) 57.3	(266) 42.7
Language spoken in home				
English	(6071) 84.2	(1140) 19.8***	(4455) 67.9	(2107) 32.1***
Other language	(733) 77.2	(216) 22.8	(593) 62.8	(351) 37.2
BMI				
Normal	(3567) 82.6	(752) 17.4	(2,163) 59.9	(1446) 40.1
Overweight or Obese	(1020) 81.0	(239) 19.0	(913) 59.9	(611) 40.1
Self-rated physical health				
Excellent	(519) 79.0	(138) 21.0	(680) 55.9	(537) 44.1***
Very good	(1618) 82.9	(334) 17.1	(1139) 58.1	(823) 41.9
Good	(1935) 82.4	(414) 17.6	(1041) 63.5	(599) 36.5
Fair	(597) 82.9	(123) 17.1	(272) 69.9	(117) 30.1
Poor	(79) 79.0	(21) 21.0	(31) 52.5	(28) 47.5
Self-rated mental health				
Excellent	(707) 81.2	(164) 18.8	(815) 58.7	(574) 41.3**
Very good	(1577) 82.4	(337) 17.6	(1132) 58.0	(820) 42.0
Good	(1512) 81.5	(343) 18.5	(821) 62.4	(494) 37.6
Fair	(763) 83.7	(149) 16.3	(297) 65.7	(155) 34.3
Poor	(183) 83.9	(35) 16.1	(92) 61.7	(57) 38.3
Most recent check-up when not sick				
During last 12 months	(2665) 82.3	(574) 17.7	(1661) 57.5	(1226) 42.5***
More than 12 months or unsure	(2072) 81.9	(457) 18.1	(1492) 63.1	(874) 36.9
Unmet physical health care needs				
Yes	(1049) 79.6	(269) 20.4**	(461) 55.9	(364) 44.1**
No	(3683) 82.9	(759) 17.1	(2683) 60.8	(1728) 39.2
Unmet mental health care needs				
Yes	(869) 80.6	(209) 19.4	(306) 61.1	(195) 38.9
No	(3837) 82.4	(817) 17.6	(2828) 59.9	(1892) 40.1
PYD Benchmark				
Met	(3178) 82.3	(682) 17.7	(2152) 59.2	(1481) 40.8*
Did not meet	(1500) 81.8	(334) 18.2	(943) 62.4	(568) 37.6

* p < .05 ** p < .01 *** p < .001

Variable	Female Non Gamblers (n=4,755) 82.2%	Female Active Gamblers (n=1,032) 17.8%	Male Non Gamblers (n=3,166) 60.0%	Male Active Gamblers (n=2,108) 40.0%
School Grades				
High (average B or higher)	(3431) 82.9	(706) 17.1*	(1915) 59.5	(1301) 40.5
Low (average C or lower)	(1155) 80.1	(287) 19.9	(1081) 59.5	(737) 40.5
Asthma diagnosis ever				
Yes or not sure	(1238) 81.8	(276) 18.2	(718) 58.9	(500) 41.1
No	(3505) 82.3	(753) 17.7	(2439) 60.5	(1591) 39.5
Other chronic health conditions (inc., developmental, sensory, emotional, learning disorders)				
None	(2785) 82.8	(578) 17.2	(2143) 60.2	(1415) 39.8
One or more	(1906) 81.1	(444) 18.9	(960) 59.3	(658) 40.7
Five daily servings of fruits or vegetables				
Yes	(789) 83.1	(161) 16.9	(527) 57.0	(398) 43.0*
No	(3922) 82.0	(860) 18.0	(2595) 60.7	(1680) 39.3
Two or more glasses of milk daily				
Yes	(1238) 80.4	(302) 19.6*	(1294) 58.8	(905) 41.2
No	(3500) 82.8	(726) 17.2	(1853) 60.9	(1189) 39.1
Eats breakfast daily				
Yes	(1712) 85.0	(301) 15.0***	(1303) 63.3	(757) 36.7
No	(3020) 80.7	(723) 19.3	(1822) 58.0	(1322) 42.0
Drank soda during past 7 days				
Any	(3200) 81.6	(720) 18.4	(2468) 58.1	(1777) 41.9***
None	(1539) 83.4	(307) 16.6***	(687) 68.3	(319) 31.7
Days with 60+ mins. physical activity in typical week				
0	(702) 85.4	(120) 14.6**	(332) 74.9	(111) 25.1***
1	(423) 80.7	(101) 19.3	(207) 69.0	(93) 31.0
2	(494) 83.3	(99) 16.7	(251) 64.2	(140) 35.8
3	(623) 83.5	(123) 16.5	(323) 65.9	(167) 34.1
4	(595) 82.4	(127) 17.6	(345) 62.4	(208) 37.6
5	(774) 82.6	(163) 17.4	(514) 60.0	(342) 40.0
6	(407) 82.1	(89) 17.9	(310) 54.6	(258) 45.4
7	(711) 77.5	(206) 22.5	(870) 52.8	(779) 47.2
Weeknight television viewing				
None	(805) 84.0	(153) 16.0	(526) 72.1	(204) 27.9***
Any	(3928) 81.9	(868) 18.1	(2617) 58.2	(1,883) 41.8

* p < .05

** p < .01

*** p < .001

Variable	Female Non Gamblers (n=4,755) 82.2%	Female Active Gamblers (n=1,032) 17.8%	Male Non Gamblers (n=3,166) 60.0%	Male Active Gamblers (n=2,108) 40.0%
Video games and computer use not for school				
None	(1341) 85.0	(237) 15.0**	(524) 65.1	(281) 34.9**
Any	(3387) 81.3	(781) 18.7	(2612) 59.2	(1801) 40.8
Self-perception of weight				
Underweight or underweight	(2180) 81.0	(511) 19.0*	(1417) 60.8	(915) 39.2
About right	(2545) 83.1	(516) 16.9	(1734) 59.6	(1175) 40.4
Mental health status (MHI-5)				
High (25-30)	(1880) 83.0	(385) 17.0	(1748) 59.0	(1217) 41.0†
Low (5-24)	(2793) 81.7	(624) 18.3	(1342) 61.9	(837) 38.1
Did you ever feel sad, stop usual activities in past 12 months				
Yes	(1146) 80.5	(277) 19.5*	(423) 61.2	(268) 38.8
No	(3560) 82.9	(734) 17.1	(2680) 60.1	(1781) 39.9
Ever seriously consider attempting suicide in past 12 months				
Yes	(725) 78.2	(202) 21.8***	(304) 62.9	(179) 37.1
No	(3977) 82.9	(818) 17.1	(2816) 59.9	(1885) 40.1
Ride in car driven by a teenager who had been drinking alcohol, in past 30 days				
No	(4187) 83.7	(817) 16.3***	(2902) 62.6	(1733) 37.4***
Yes	(559) 72.8	(209) 27.2	(261) 41.8	(363) 58.2
Did not go to school because felt unsafe				
No days	(4585) 82.7	(956) 17.3***	(3051) 60.5	(1993) 39.5***
One or more days	(165) 69.3	(73) 30.7	(106) 50.7	(103) 49.3
Carried a gun or other weapon in past 30 days				
No days	(4459) 84.3	(832) 15.7***	(2558) 64.8	(1388) 35.2***
One or more days	(281) 59.8	(189) 40.2	(592) 45.9	(697) 54.1
In a physical fight during past 12 months				
None	(4050) 85.2	(703) 14.8***	(2482) 66.6	(1245) 33.4***
One or more times	(683) 68.3	(317) 31.7	(666) 44.3	(839) 55.7
Suspended from school in past 12 months				
None	(4270) 83.3	(855) 16.7***	(2672) 62.7	(1590) 37.3***
One or more times	(471) 74.1	(165) 25.9	(476) 49.6	(483) 50.4

* p < .05 ** p < .01

*** p < .001

Variable	Female Non Gamblers (n=4,755) 82.2%	Female Active Gamblers (n=1,032) 17.8%	Male Non Gamblers (n=3,166) 60.0%	Male Active Gamblers (n=2,108) 40.0%
Been offered, sold or given illegal drug on school property by anyone in past 12 months				
None	(3938) 85.0	(697) 15.0***	(2580) 64.3	(1431) 35.7***
One or more times	(804) 71.2	(326) 28.8	(573) 47.1	(643) 52.9
Times you sold illegal drugs in past 12 months				
None	(4491) 83.4	(894) 16.6***	(2910) 62.3	(1758) 37.7***
One or more times	(250) 66.8	(124) 33.2	(241) 42.9	(321) 57.1
Attacked someone with the idea of seriously hurting them				
None	(4469) 83.1	(910) 16.9***	(2910) 62.4	(1753) 37.6***
One or more times	(267) 70.8	(110) 29.2	(240) 42.7	(322) 57.3
Stolen something worth more than \$10 in past year				
No	(4014) 84.5	(736) 15.5***	(2672) 64.7	(1461) 35.3***
Yes	(721) 71.9	(282) 28.1	(485) 44.0	(618) 56.0
Stopped by the police in the past 12 months				
No	(3628) 85.6	(611) 14.4***	(2207) 67.1	(1082) 32.9***
Yes	(1109) 73.2	(407) 26.8	(944) 48.7	(994) 51.3
Ever had sexual intercourse				
No	(5871) 85.3	(1012) 14.7***	(4231) 70.6	(1765) 29.4***
Yes	(943) 74.0	(331) 26.0	(807) 54.4	(676) 45.6
Active tobacco user				
No	(3914) 84.3	(731) 15.7***	(2525) 64.1	(1417) 35.9***
Yes	(769) 73.2	(281) 26.8	(553) 46.7	(630) 53.3
Illegal drug use in past 30 days				
No	(3401) 84.0	(647) 16.0***	(2131) 63.7	(1215) 36.3***
Yes	(869) 75.4	(283) 24.6	(545) 48.5	(579) 51.5
Smoke from other people's cigarettes is harmful to you				
Definitely yes	(3786) 83.1	(770) 16.9***	(2292) 61.7	(1425) 38.3***
Probably yes	(599) 78.7	(162) 21.3	(443) 52.5	(401) 47.5
Probably not	(78) 73.6	(28) 26.4	(89) 55.6	(71) 44.4
Definitely not	(64) 72.7	(24) 27.3	(75) 61.5	(47) 38.5
Do you think you will smoke a cigarette at any time during the next year?				
Definitely not	(3259) 85.3	(561) 14.7***	(2228) 66.1	(1145) 33.9***
Probably not	(600) 78.2	(168) 21.8	(343) 47.3	(382) 52.7
Probably yes	(410) 73.7	(146) 26.3	(218) 48.5	(231) 51.5
Definitely yes	(377) 73.8	(134) 26.2	(244) 48.9	(255) 51.1

Variable	Female Non Gamblers (n=4,755) 82.2%	Female Active Gamblers (n=1,032) 17.8%	Male Non Gamblers (n=3,166) 60.0%	Male Active Gamblers (n=2,108) 40.0%
What percentage of your grade do you think smoked in the past 30 days?				
< 10%	(524) 87.5	(75) 12.5***	(547) 68.0	(257) 32.0*
11% to 20%	(718) 85.1	(126) 14.9	(573) 57.4	(426) 42.6
21% to 30%	(827) 82.0	(181) 18.0	(555) 56.3	(430) 43.7
31% to 40%	(802) 81.3	(184) 18.7	(477) 59.4	(326) 40.6
41% to 50%	(638) 80.2	(158) 19.8	(302) 57.3	(225) 42.7
51% to 60%	(478) 81.2	(111) 18.8	(207) 60.2	(137) 39.8
61% to 70%	(292) 78.5	(80) 21.5	(115) 58.1	(83) 41.9
More than 70%	(213) 78.0	(60) 22.0	(98) 62.0	(60) 38.0
If one of your best friends offered you a cigarette, would you smoke it?				
Definitely not	(3195) 85.5	(542) 14.5***	(2165) 65.6	(1137) 34.4***
Probably not	(630) 75.7	(202) 24.3	(391) 47.8	(427) 52.2
Probably yes	(429) 75.0	(143) 25.0	(232) 50.7	(226) 49.3
Definitely yes	(383) 76.4	(118) 23.6	(244) 52.8	(218) 47.2
If you wanted to get some tobacco, how easy would it be for you to get some?				
Very hard	(619) 91.6	(57) 9.4***	(431) 82.9	(89) 17.1***
Sort of hard	(390) 84.8	(70) 15.2	(265) 68.1	(124) 31.9
Sort of easy	(1041) 84.1	(197) 15.9	(633) 60.2	(419) 39.8
Very easy	(2518) 78.8	(676) 21.2	(1656) 54.8	(1366) 45.2
Is there a rule against tobacco in your school?				
Rule is strictly enforced	(2522) 83.6	(495) 16.4**	(1674) 61.5	(1047) 38.5
Rule sometimes enforced	(1603) 80.9	(379) 19.1	(951) 57.7	(698) 42.3
Rule is not enforced	(322) 78.0	(91) 22.0	(238) 59.1	(165) 40.9
There is no rule	(125) 79.6	(32) 20.4	(117) 59.7	(79) 40.3
Does someone living in your house (other than you) smoke cigarettes?				
Nobody smokes	(3093) 83.0	(634) 17.0	(2065) 60.9	(1328) 39.1
Smokes, not in the house	(1125) 79.7	(286) 20.3	(617) 57.2	(462) 42.8
Smokes in the house	(341) 83.2	(69) 16.8	(246) 59.1	(170) 40.9
Days with at least one drink of alcohol in past 30 days				
None	(2560) 87.4	(370) 12.6***	(1805) 69.0	(811) 31.0***
One or more	(1911) 76.1	(600) 23.9	(1053) 48.8	(1105) 51.2
Five or more drinks in a row during past 30 days				
No	(3435) 85.4	(589) 14.6***	(2257) 65.8	(1173) 34.2***
Yes	(997) 73.2	(365) 26.8	(570) 44.7	(705) 55.3

* p < .05

** p < .01

*** p < .001

Variable	Female Non Gamblers (n=4,755) 82.2%	Female Active Gamblers (n=1,032) 17.8%	Male Non Gamblers (n=3,166) 60.0%	Male Active Gamblers (n=2,108) 40.0%
If you wanted to get some beer, wine, etc. how easy would it be for you to get some?				
Very hard	(393) 90.3	(42) 9.7***	(319) 80.4	(78) 19.6***
Sort of hard	(557) 87.2	(82) 12.8	(420) 63.8	(238) 36.2
Sort of easy	(1362) 82.5	(288) 17.5	(850) 58.4	(605) 41.6
Very easy	(2114) 79.1	(560) 20.9	(1218) 55.7	(970) 44.3
Parent health beliefs (cigarettes, alcohol, marijuana)				
Very wrong	(2120) 85.6	(356) 14.4***	(1322) 68.0	(623) 32.0***
Less strong	(2,086) 79.3	(546) 20.7	(1287) 54.1	(1091) 45.9
Personal health beliefs (cigarettes, alcohol, marijuana)				
Very wrong	(1415) 88.4	(186) 11.6***	(991) 73.7	(354) 26.3***
Less strong	(2744) 79.4	(713) 20.6	(1604) 54.7	(1330) 45.3
Community health beliefs (cigarettes, alcohol, marijuana)				
Very wrong	(1487) 84.3	(276) 15.7**	(921) 64.8	(501) 35.2***
Less strong	(2649) 81.1	(619) 18.9	(1652) 58.2	(1186) 41.8
Social control				
Strong (13-16)	(860) 87.0	(128) 13.0***	(681) 68.1	(319) 31.9***
Less strong (4-12)	(3237) 81.2	(748) 18.8	(1874) 58.2	(1346) 41.8
During the past 30 days, did you exercise to lose weight?				
Yes	(2913) 81.1	(678) 18.9**	(1351) 61.0	(865) 39.0
No	(1810) 84.3	(338) 15.7	(1783) 59.7	(1206) 40.3
Are you trying to gain weight?				
No	(4524) 82.7	(945) 17.3***	(2450) 62.9	(1448) 37.1***
Yes	(209) 72.3	(80) 27.7	(696) 51.8	(647) 48.2
Social control				
Strong (13-16)	(860) 87.0	(128) 13.0***	(681) 68.1	(319) 31.9***
Less strong (4-12)	(3237) 81.2	(748) 18.8	(1874) 58.2	(1346) 41.8

* p < .05 ** p < .01 *** p < .001